A STUDY ON RISK FACTORS AMONG PATIENTS WITH ISCHEMIC HEART DISEASE AGED 18 TO 40 YEARS OF AGE IN BASRA CITY

NASREEN MEHBA[1] & SAJJAD SALIM ISSA[2]

[1]Basrah Health Office, Basrah, Iraq

[2]College of Nursing, University of Basrah, Basrah, Iraq

ABSTRACT

This study is a case control study for a patient with ischemic heart disease with age less than 40 years who are admitted to the coronary care units in three major hospitals in Basra city:

- Al-Basra General Hospital.

- Al-Sadder Teaching Hospital.

- Al-Fayhaa General Hospital.

The comparison was made with people from the same age group, but counsel the outpatient units for a condition other than ischemic heart disease. The number of cases is 60, and the number of control is 60 too.

The proportion of cases with coronary artery disease who were under 40 years was 5.681 from the total admission during the period of study.

During studying the age groups, it was recognized that the number of people who have had coronary heart disease, increases with increasing age (33 patient from 60 patient with coronary heart disease was from the age group 36-40) (55%).Regarding gender difference, males were more than females (45 male, 25 female) (75% male, 25% female).Occupational hazard, the unemployed people were more liable to develop C.H.D from the employers.

Sixty three (63.3%) from the cases with C.H.D were living in an urban areas.

Smoking was a significant risk factor in C.H.D in young people, the study shows (66.7%) patient are smokers while from the control group (40%) were smoker. From cases with C.H.D (58.3%) patients were with a positive family history of ischemic heart disease,(30%)only from the control has positive family history of CHD. By study the history of hypertension (53%) of cases had hypertension, from the control group (26.7%) were suffering from H.T.

Among diabetics only (30%) from the cases were having diabetes mellitus. Only 10 cases (16.7%) with C.H.D were alcohol drinker. Among drug addict only (5%) of the cases were drug addict.

KEYWORDS: CHD, IHD, BP, DM, HDL, ACEI, LDL, BMI, HT, CAD, ARB

INTRODUCTION

Definition

Ischemic heart disease is a condition characterized by inadequate oxygen or blood supply to a portion of myocardium.

Typically occurs when there is imbalance between myocardial oxygen supply and demand, Ischemic heart disease is the most common cause of death in western countries.[1]

Epidemiology

Coronary heart disease (C. H. D.) is a major cause of death and disability in developed countries, although its mortality rates have declined over the past four decades in the U. S. CHD. remains responsible for about one third of all death in individuals over 35 yr. old age [3]. Although coronary heart disease (CHD) primarily occurs in patients over the age of 40, younger men and women can be affected. Most studies have used an age cutout of 40 to 45 years to define "young" patients with CHD or acute myocardial infarction (MI) (4).

The prevalence of CHD in younger subjects is difficult to be established accurately since it is frequently a silent process. The frequency with which this occurs was examined in an autopsy study of 760 young (age 15 to 34 years) victims of accidents, suicides, or homicides. Advanced coronary atheroma was seen in 2 % of men and no women aged 15 to 19. An advanced lesion was present in 20 and 8 % of men and women aged 30 to 34, respectively, while 19 and 8 %, respectively, had a ≥40 % stenosis of the left anterior descending artery.[5]There are also limited data on the frequency of MI in younger subjects. In the Framingham Heart Study, the incidence of an MI over a 10-year follow-up5was 12.9/1000 in men 30 to 34 years old and 5.2/1000 in women 35 to 44 years old. The incidence of MI was eight to nine times greater in men and women [6.] Although CHD is an uncommon entity in young patients, it constitutes an important problem for the patient and the treating physician because of the devastating effect of this disease on the more active lifestyle of young patients. In addition, these patients have different risk factor profiles, clinical presentations, and prognosis than older patients. All of these factors should be taken into consideration when treating young patients with CHD[7]

Pathophysiology

Limitation of blood flow to the heart due to different causes like narrowing of blood vessels as in atheroma, obstruction as in thrombus, decrease blood supply like in anemia or increase the metabolic demand as in hyperthyroidismwill lead to myocardial ischemia which is either reversible like in angina pectoris or irreversible as in MI[.8]

Risk Factors

A: Age

CVD becomes increasingly common with advancing age. As a person gets older, the heartundergoes subtle physiologic changes, even in the absence of disease. The heart muscle of the aged heart may relax less completely between beats, and as aresult, the pumping chambers become stiffer and may work less efficiently[.9]

B: Gender

A man is at greater risk of heart disease than a pre-menopausal woman. Once past themenopause, a woman's risk is similar to a man's. Due to the effect of estrogen that increases after menopause[.10]

C: Family History

A family history of CVD indicates a person's risk. If a first-degree relative has had coronary heart disease or stroke before the age of 55 years (for a male relative) or 65 years[11]

D: Hypertension

Globally, nearly one billion people have high blood pressure (hypertension); of these, two third are in developing countries. Hypertension is one of the most important causes of premature death worldwide and the problem is growing[10].

Hypertension is the leading cause of CVD worldwide, People with hypertension are more likely to develop complications of diabetes[11] High blood pressure is called the "silent killer" because it mostly has no warning signs [11]

E: Tobacco Use

Smoking is estimated to cause nearly 10 per cent of all CVD[9]

The risk of developing CVD is higher in female smokers, young men, and heavy smokers[12]

F: Diabetes

Diabetes is defined as having a fasting plasma glucose value of 7.0 mmol/l (126 mg/dl) or higher, in 2008, diabetes was responsible for 1.3 million deaths globally. The risk of cardiovascular events is from two to three times higher in people with type 1 or type 2 diabetes and the risk is disproportionately higher in women. Cardiovascular risk increases with raised glucose values.[9]

G: Physical Inactivity

Insufficient physical activity can be defined as less than five times 30 minutes of moderate activity per week, or less than three times 20 minutes of vigorous activity per week, (9)

H: Cholesterol Level

CHD risk is related to cholesterol levels, People with low levels of HDL cholesterol have an increased risk of CHD and a worse prognosis after a myocardial infarction. In the UK, it is suggested that the target cholesterol is < 4 mmol/L for people with diabetes or established CVD or for people at high risk of developing CVD. People with HDL cholesterol <1 mmol/L should also be considered for treatment. (13)

I: Overweight and Obesity

Obesity is an independent risk factor for CHD. It is also a risk factor for hypertension, hyperlipidemia, diabetes and impaired glucose tolerance. Central or abdominal obesity is most significant. Those with central obesity have over twice the risk of heart attack.[14]

J: Alcohol Intake

The World Health Report in 2002 estimated that 2% of CHD in men in developed countries is due to excessive alcohol consumption[15].

Clinical Features

Patients may experience ischemic heart disease symptoms daily or just occasionally. Common symptoms include chest pain, chest pressure, or shortness of breath that:

- Is relieved by rest or drugs ?

- May feel as if pain starting in the chest and spreads to the arms, back, or other areas ?

- May feel like gas or indigestion ?

- Occurs when the heart must work harder, usually during physical exertion?(16)

   Serious symptoms that might indicate a life-threatening condition

- Chest pain, typically on the left side of the body (angina pectoris)

- Clammy skin

- Nausea with or without vomiting

- Pain in the neck or jaw

- Rapid breathing (tachypnea) or shortness of breath

- Shoulder or arm pain(16)

PREVENTION

Primary Prevention

Prevention   involves: exercise,   avoiding obesity,   treating hypertension,   a healthy   diet, decreasing cholesterol levels, and stop smoking,.(17)

Secondary Prevention

Secondary prevention is preventing further squeal of already established disease. Regarding coronary artery disease, this can mean risk factor management that is carried out during cardiac rehabilitation that start in the hospital after MI, angioplasty or heart surgery and continuing for a minimum of three months. Exercise is a main component of cardiac rehabilitation along with diet, smoking cessation, and blood pressure and cholesterol management. Beta blockers may also be used for this purpose.[17]

OBJECTIVES OF THE STUDY

- To Study the proportion of patients with C. H. D who are under forties from the total number of admission to the CCU. During the period of the study.

- To Study the risk factors associated with C. H. D in young people and compare these risk factors with those who are healthy and of same age group.

METHODOLOGY

Type of the Study

A case control study designed to study the risk factors of coronary artery disease under 40 years of age who were admitted to the coronary care units and study the proportion of these cases from the total cases of coronary artery disease that are admitted to the coronary care units in three major hospitals in Basra city:

1- Al-Sadder Teaching Hospital 2- General Basra Hospital

3- Al-Fayhaa General Hospital

During the period from the first of March 2014 to the first of October 2014 The data were collected from the patient by direct interview, and review of their investigation.

The Studied Population

The cases who were patients whose age from 18-40 having IHD and admitted to the CCU during the study.

The control group were people from the same age group but counsel the O. P units for a condition other than chest pain. Refusal rate among the controls were 10%.

The Diagnosis
The Diagnosis Based on

History: The criteria of ischemic pain and the relation of risk factors

Examination: Include BP, Body weight, Height in meter,(for both cases and control groups) and BMI.

Investigations: These tests were taken for every patient from the patient group and the control group.

- Fasting blood sugar, from 80-126 mg/dl[18]

- High density lipoprotein (HDL), less than 1 mmol/l consider for treatment[18]

- Low density lipoprotein (LDL), more than 4 mmol/l consider for treatment(18)

- Total serum cholestrol equal or less than 200mg./ dl. (5.2)mmol./l.(18)

- **5- ECG:** electro cardio gram was done for every person whether patient with ischemic heart disease or the control group

- Cardiac enzymes didn't measured because the study include all the types of IHD.

The Sample Size

The control sample taken by randomized randomization method, the sample size were 60 cases and 60 control.

Statistical Method

Data were fed on computer and analyzed on SPSS (Statistical Package for Social Science –version 16). Rates were calculated as appropriate.

1- P value 2-Odds ratio 3-Chi square

The Questionnaire

Age 18-45 years, Sex male or female, Occupation; employer or not.

Address; Urban or rural areas, Smoking status; smoker or non-smoker

Alcohol drinking; alcohol drinker or non-drinker, Family history of ischemic heart diseases Hypertension ; if blood pressure more than 120/80 in a known case of HT or by more than one measure if discover by examination.

Diabetes mellitus; FBS more than 126 mg/dl. Body mass index; by measurement of body weight(kilo gram) over height (meters)[19]

RESULTS

The Age Groups

For the age group (18-25) the percentage of cases and for the controls with IHD were 1.7%. The age group

(26-30) the percentage of cases and for the controls were 10%. For the age group (31-35) the percentage of cases with IHD and for the controls were 33. 3%. For the age group (36-40) the percentage of cases and for the controlwere55%.there is no significant association (p-value = 1).

Table 1: Distribution of Studied Population According to the age Group

Age Group	Category		Total
	Case	Control	
from 18 to 25	1	1	2
	1.7%	1.7%	1.7%
from 26 to 30	6	6	12
	10.0%	10%	10%
from 31 to 35	20	20	40
	33.3%	33.3%	33.3 %
from 36 to 40	33	33	66
	55.0%	55.0%	50.0%
Total	60	60	120
	100.0%	100.0%	100.0%

The Sex Groups

75% of the cases were male while 25% were female,

The controls were from the same percentage for both sexes.

P value =1 so the association of IHD with gender was not significant.

Table 2: Distribution of People According to Gender

Table 3. 2: Gender Category	Category		Total
	Case	Control	
Male	45	45	90
	75.0%	75.0%	75.0%
Female	15	15	30
	25.0%	25.0%	25.0%
Total	60	60	120
	100.0%	100.0%	100.0%

P-value= 1

The relation between age and sex:

The number of male cases were 45 while the number of female cases were 15. The largest percentage of cases were among males (75)%,while for Female (25)%. Percentage of cases increase with increasing age, from 1.66% at age group 18-25 to 55% at age group 36-40. Male: Female ratio were highest at age group 36-40, while at age 18-25 it were zero.

Table 3: The Matching Table between the Age and Gender

Age Group	Male Cases		Female Cases		All Cases		Male / Female Ratio
	No.	%	No.	%	No.	%	
18 – 25	1	1.66	0	0	1	1.66	0
26 – 30	4	66.6	2	33.3	6	10	2:1
31 – 35	15	75	5	25	20	33.3	3:1
36 – 40	25	75.7	8	24.3	33	55	3.1:1
Total	45	75	15	25	60	100	3:1

The Occupation

The number of the employed cases 14(23.3%) while the employed control 25(41.7%). The number of un employed cases were46976.7)% while the un employed control 35(58.3)%The association between IHD and un employment were significant. P value 0.05, so work is a protective from IHD.

Table 4: Distribution of IHD According to the Occupation

Occupation	Category		Total
	Case	Control	
Employee	14	25	39
	23.3%	41.7%	32.5%
Unemployed	46	35	81
	76.7%	58.3%	67.5%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2=3.799, P-value= 0.05

The Residency

This table show that 63.3%of cases were living in urban areas while 36.7% living in rural areas. Among the control group 68.3%were living I in an urban areas while 31.7% living in rural areas. P value =0.7 so the association was not significant.

Table 5: The Distribution of IHD in Relation to the Residency

Address	Category		Total
	Case	Control	
Urban	38	41	79
	63.3%	68.3%	65.8%
Rural	22	19	41
	36.7%	31.7%	34.2%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2= 0.148, P-value= 0.7.

Smoking

The present study show that 66.7% of the cases were smoker while 33.3% were non smoker. While among the control group 40% were smoker,60% were non smoker.P value =0.006 so the association was significant

Table 6: Distribution of People According to Smoking

Smoking	Category		Total
	Case	Control	
Yes	124	24	64
	66.7%	40.0%	53.3%
No	20	36	56
	33.3%	60.0%	46.7%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2= 7.533, P-value= 0.006, OR= 3S

Family History

The percentage of cases with positive family history of IHD was 58.3% while the cases with no family history was 41.7%.

For the control group the percentage of those with positive family history was 30% while those with no family history was 70%.

P value=0.003,the association was significant

Table 7: Distribution of People According to Family History Association

Family History of IHD	Category		Total
	Case	Control	
Yes	35	18	53
	58.3%	30.0%	44.2%
No	25	42	67
	41.7%	70.0%	55.8%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2= 8.651, P-value= 0.003, OR= 3.267

Hyper Tension

The percentage of cases who were hypertensive was 53.3% while cases that were non hypertensive were 46.7%,for the control group the percentage of the hypertensive was 26.7% while the non hypertensive were73.3%.

P value =0.005 so the association was significant.

Table 8: The Relation between Hypertension and IHD

Hypertension	Category		Total
	Case	Control	
Yes	32	16	48
	53.3%	26.7%	40.0%
No	28	44	72
	46.7%	73.3%	60.0%
Total	**60**	**60**	**120**
	100.0%	100.0%	100.0%

Chi^2= 7.813, P-value= 0.005, OR= 3.143

Diabetes Mellitus

This table show that the percentage of diabetic cases with IHD were 30% while the percentage of the non diabetic cases were70% while the control who had DM were 16.7% and those who had no DM and no IHD were 83.3% P value is 0,131sothat the association between IHD and DM is not significant.

Table 9: Distribution of People According to DM

Diabetes	Category		Total
	Case	Control	
Yes	18	10	28
	30.0%	16.7%	23.3%
No	42	50	92
	70.0%	83.3%	76.7%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2= 2.283, P-value= 0.131, OR = 2.14

Alcohol Intake

10 cases (16)%were alcoholic, while 4(6.7)%of the control were alcoholic. 50(83.3) % of cases were non alcoholic while 56(93.3) %of the control were nonalcoholic. The association between alcohol and IHD were not significant. (p value =0.155). I didn't ask about amount of alcohol intake because it was not socially acceptable.

Table 10: Distribution of People According to Alcohol Intake

Alcohol	Category		Total
	Case	Control	
Yes	10	4	14
	16.7%	6.7%	11.7%
No	50	56	106
	83.3%	93.3%	88.3%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

Chi^2= 2.022, P-value= 0.155

Drug Addiction

The percentage of the cases of IHD who were drug addict was5% and cases with drug addiction were 95%, while the control people with drug addiction and no IHD were 1.75 and the control with no drug addiction were98..3%.

P value =0.619 so the association was anon significant

Table 11: The Distribution of Cases According to Drug Addiction

Drug Addiction	Category		Total
	Case	Control	
Yes	3	1	4
	5.0%	1.7%	3.3%
No	57	59	116
	95.0%	98.3%	96.7%
Total	**60**	**60**	**120**
	100.0%	**100.0%**	**100.0%**

FE= 0.259, P-value= 0.619

DISCUSSIONS

Our study shows that about 5.681 % of the patients were admitted to the CCU in the three studied hospitals were from 18 – 40 years, while in the US there was only 3% of all cases of CAD occur at this age group (20).

Age

Both age and gender were matched to prevent confounding factor.

The highest percentage of cases of IHD were at the age from 36-40 (55%), while the lower percentage were at the age from 18-25 (1.7%).

P value =1, the association between the age and IHD was not significant.

A study done in India by Sricharan K. N. shows that the higher percentage of cases of IHD occurs below forties were at age 35-40(70 %), while there were any cases below 25 y.(21)

Gender

The percentage of cases IHD in males was 75%, while in female was 25%.

P value for the gender =1, the association between IHD and sex was not significant.

Residency

The percentage of cases who were living in an urban areas was 63.3% while in the rural areas was 36.7%. P value =0.7, so the association was a non significant.

Occupation

The percentage of cases among the employers was 23.3% while among the non employers was 76.7%, this represents the protective effect of work.

P value =0.05 so the association between unemployment and IHD was significant.

Smoking

The percentage of smokers among the cases were 66.7%and for the control group were 40%. While the percentage of cases who were non smokers was 33.3% and for the control group the percentage of the non-smokers was 60%. So the study reveals high association between smoking and IHD in young people(P=0.006),with about 3 time risk for smoker to develop IHD than the non smokers. Oqawa K. in Japan found that 83% of cases were smokers (22), while Srichan study in India found that smoking were the most prevalent R. F for IHD in young adult(70)%.(21)

Hyper Tension

This study shows significant association between hypertension and IHD, P-value =(0.005),so hypertension increases the risk of IHD about 3 times than in non-hypertensive, (O. R=3.143) The percentage of cases who had H. T was 53.3%while the percentage of control who had H. T was 26.7%. The percentage of cases who did not have HT. was 46.7% while the percentage of control group with no H. T 73.3%.

In Oqawas study in Japan the percentage of H. T were 29% (22), in Iraq, a study of Dr. Shihab show that H. T was a significant risk factor for IHD in young people.(23)

Family History

There was a significant association between family history and C. H. D (p=0.003), Percentage of cases with positive family history was 58.3% while the control with family history of IHD was 30%.

For those with no family history of IHD the percentage of cases was 41.7% and the control was 70%. Also the risk for the development of IHD in people with family history of IHD 3 times than people with no family history.

Diabetes Mellitus

The percentage of cases who were diabetic was 30% while the percentage of non-diabetic cases was 70%, for the control group the percentage of the diabetic were 16.7% and the percentage of the non-diabetics was 83.3%.

P value =0. 131, so the association between DM and IHD is a non significant.

In the study of Oqawa in Japan D. M represents 38% of cases of IHD below 40(24),while in the study of Sricharan study in India D. M represents 13% of cases which regards as a significant risk factor.(21)

Alcohol

The percentage of cases who were alcoholic was 16.7%while the percentage of the cases who were non-alcoholic was 83.3%,among the control group the percentage of alcoholic was 6.7% and the percentage of non-alcoholic was 93.3%. P-value =0.155 so the association between alcohol intake and IHD is not significant.

Drug Addiction

The percentage of cases who were drug addict was 5% while the percentage of addicts among the control was 1.7%.

P value for drug addiction was 0.619 so the association between IHD and drug addiction was a non significant.

Serum Cholesterol and Lipoproteins

P-value for hypercholestremia and for rise HDL. were 0.0001 so both were a significant risk factor for IHD in young people.

Hypercholestremia in the study of Oqawa represents 44% of cases and was regarding as a significant risk factor.(22)

HDL in ZahriMuda study in Malaysia also was one of the significant risk factor (23).

BMI

The mean BMI for the cases was 34.7, p value =0.146

The mean BMI for the control was 28,p value =0.146.

The association between BMI and IHD was not significant.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

- The percentage of CHD in people aged less than 40 was 5.7%.

- The risk factors that carry positive association were:-smoking, hypertension, family history, serum cholesterol, HDL and unemployment.

- Risk factors with no association were:- age, sex, address, diabetes mellitus alcohol intake and drug addiction.

RECOMMENDATIONS

- Primary prevention through Education programs that deal with risk factor of IHD like HT, DM, obesity and hyperlipidemia.

- Early screening and early treatment for IHD.

- Educate people about the clinical features of IHD especially for young adults.

- Further studies for the same subject should try to overcome the confounding

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